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GNAPHOSID SPIDERS OF NORTH-CENTRAL TEXAS (ARANEAE, GNAPHOSIDAE)

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ABSTRACT

Thirty-two species representing 11 genera of Gnaphosidae are recorded from north-central Texas. The study has extended the ranges of *Callilepis chisos* Platnick and Shadab, *Gnaphosa altudona* Chamberlin, *Haplodrassus chamberlini* Platnick and Shadab, *Herpyllus hesperolus* Chamberlin, *Nodocion rufithoracicus* Worley, *Rachodrassus captiosus* (Gertsch and Davis), and *Sergiolus angustus* (Banks). Habitat and natural history data for species are presented.

INTRODUCTION

North-central Texas includes, as used here, Wilbarger, Wichita, Baylor, Archer, Clay, and Montague counties. The eastern portion of the area is included in the Cross Timbers and Prairies, whereas the western portion is within the Rolling Plains (Gould 1975). The study area is included in the Texas and Kansan biotic provinces of Blair (1950).

Five araneid studies have confined themselves to the north-central Texas area. Carpenter (1972) conducted a survey of the Salticidae of Wichita County; and Cokendolpher, Horner, and Jennings (1979) reported on the Philodromidae and Thomisidae. Zaltsberg (1977) and Salmon and Horner (1977) studied aerial movements of spiders in Wichita Falls, and Matelski (1982) investigated *Peckhamia* (Salticidae). Other information on spiders from this area appears as locality records in revisionary works or checklists. The lack of information concerning gnaphosid spiders from this area prompted this study. This paper describes the gnaphosid fauna of north-central Texas and presents natural history data and range extensions for species.

METHODS AND MATERIALS

The collection of gnaphosid spiders at Midwestern State University was examined, checked for proper taxonomy and habitat, and locality records recorded. Intensive field work was conducted in Wichita County from July 1981 to September 1982. The primary method of collection was overturning ground cover. Large to small stones, logs, cardboard, lumber, sheet metal, and cow manure all harbored gnaphosids. Fallen bark, leaves,

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and other ground litter were placed in a sifter with a 1 cm mesh screen and shaken over a white cloth. Any spiders present were easily seen and captured in snap-top plastic vials. A sweep net was employed where the vegetation permitted. The outer bark of trees was stripped away with a metal probe and examined for gnaphosids. Twenty-one pitfall traps were employed in Wichita County. Each trap consisted of a 1500 ml can dug flush into the ground and filled 2/3 full with a 1:1 mixture of water and ethylene glycol.The trapping periods were July 12-19, August 9-16, September 13-20, and October 11-18, 1981. At the end of each trapping period the traps were removed from the ground and the contents poured through a fine-meshed strainer and sorted. This method was abandoned when only three adult gnaphosids were collected.

Immature specimens were reared to maturity in the laboratory. Rearing chambers were made of glass or plastic tubes measuring 1 x 9, 2 x 10, or 3.5 x 10 cm. Spiders were offered food three times a week, principally termites and adult fruit flies (*Drosophila melanogaster* Meigen). Cotton stoppers were wetted once a week for five weeks but the spiders shunned the moist sides of their tubes and were not observed drinking. The practice was discontinued with no ill effects. Each tube contained a strip of heavy paper to provide cover and a molting surface. The tubes were cleaned after each molt and as prey debris accumulated.

Adult spiders collected in the field and those matured in the laboratory were killed and preserved in 70% ethanol and have been added to the Department of Biology Invertebrate Collection at Midwestern State University.

RESULTS AND DISCUSSION

Suitable ground cover seemed to be a major requirement for gnaphosids in this region. Localities with abundant cover often harbored 10 or more species within a small area. Notable exceptions were areas with sandy soil; these yielded very few spiders even if ground cover was present. The majority of the adult and penultimate specimens were collected from February to May, after which the variety and number of species declined significantly.

The accounts that follow include natural history data such as behavior, habitat, and egg sac contents.

(1) *Callilepis chisos* Platnick.–Two females were collected in May and September; one was found indoors and the other in bark debris along a small lake. These specimens, from Wichita County, extend the known range approximately 300 miles eastward from San Miguel County, New Mexico (Platnick 1975).

(2) *Cesonia sincera* Gertsch and Mulaik.–Eight of the nine specimens collected were found under rocks along the margins of two reservoirs and a pond. Similar habitat a few hundred yards from the collection sites yielded no additional specimens. Seven of the nine spiders were immature and were reared to adults in the laboratory. Two immature males collected on 26 March matured in 11 and 14 days. The five immature males collected in late March and April reached maturity between 25 April and 1 July.

(3) *Drassodes gosiutus* Chamberlin.–Only females were collected, mostly in March. Of the 16 specimens, 14 were found under rocks in broken country. Twelve of the spiders were guarding single egg sacs within their hibernacula. The hibernacula consisted of silken tubes stretched across the undersides of rocks, or of silk-lined burrows extending straight down into the ground. The female would not leave her hibernaculum until it was broken open; she would then seize the egg sac in her chelicerae and attempt to drag or push it to

safety. The 12 egg sacs contained 60, 63, 82, 83, 95, 98, 105, 105, 106, 116, and 147 eggs; one egg sac held 101 deutova. A mature female collected 26 March deposited an egg sac on 11 April. She carried the sac in her chelicerae but dropped it on 12 April to feed. Three days later she opened the egg sac and scattered the eggs. Although Platnick and Shadab (1976a) state that mature males may be found from late June to late December, none were collected by us.

(4) *Drassodes saccatus* (Emerton).–This species was more common than *Drassodes gosiutus.* All 65 specimens were found under some type of ground cover, usually stones. Gertsch (1979) states that the males of some species of *Drassodes* enclose immature females in hibernacula adjacent to their own. Thirteen males were found sharing hibernacula with females. Of these, 12 mature males were found cohabiting with penultimate females and one mature male was found in a hibernaculum with a mature female. The hibernacula varied from a sac just large enough to enclose the two spiders to silken tubes 12 cm or longer. The spiders would usually exit from opposite ends of their retreat when disturbed. Most of the specimens were collected between 18 March and 13 April. All the males found during this period were mature. Six penultimate females molted between 1 April and 22 April. A female caught on 19 May had an egg sac which contained 111 first instar spiderlings.

(5) *Drassyllus aprilinus* (Banks).–Platnick and Shadab (1982) list this species from Montague and Wichita counties and state that mature spiders have been collected year-round. The species was not encountered in this study.

(6) *Drassyllus dromeus* Chamberlin.–This spider does not appear to favor a particular habitat. Sixteen specimens were found from March to June under rocks, boards, bricks, sheet metal and willow tree bark; indoors, and by sweeping grass. Two penultimate females collected 18 March and 16 April molted 21 March and 24 April.

(7) *Drassyllus lepidus* (Banks).–This was the most common *Drassyllus* collected. Twenty-seven specimens were found from May to October under rocks, concrete, boards, sheet metal, and indoors. Eight immatures (seven males and one female) collected in April reached maturity by 30 May. An immature female collected on 30 October molted by 27 November and to an adult on 24 December.

(8) *Drassyllus notonus* Chamberlin.–Three females and one male were collected from May to June. One of the females was found under a stone, another under a board and the third indoors on a garage floor. The male was collected in June by sweeping vegetation.

(9) *Drassyllus orgilus* Chamberlin.–Nine female specimens were collected in Wichita and Clay counties during February and March. Spiders were found under rocks and boards, in grass and other vegetation, and indoors.

(10) *Drassyllus texamans* Chamberlin.–Four specimens were taken from collection sites in Wichita County on the sandy terraces along the Red River. This species seems to prefer loose, sandy soil. A female from Hardeman County was found on the silty floor of a cave (Platnick and Shadab 1982). A penultimate male collected on 20 May molted after five days.

(11) *Drassyllus* species.–A single unidentified male *Drassyllus* was found under a stone in a pasture in Wichita County. Return trips to the same locality failed to yield additional specimens. This may be a species of which only the female has been described.

(12) *Gnaphosa altudona* Chamberlin.–Five of the six specimens collected were males found under stones. All the spiders were found during June and July in rough, eroded country dominated by stones and bare ground. A female collected on 15 July had an egg sac which contained 27 first instar spiderlings. Two immature males reared in the

laboratory reached maturity on 2 and 16 August. The present record extends the range approximately 400 miles north from Brewster, Presidio, and San Patricio counties of Texas (Platnick and Shadab 1975a).

(13) *Gnaphosa clara* (Keyserling).—A single female collected on 10 June was found with two egg sacs. The first sac had already been vacated and contained only exuviae where as the second sac held 59 eggs.

(14) *Gnaphosa fontinalis* Keyserling.—Two specimens were collected in Wichita County on 6 May. No specific habitat data were recorded.

(15) *Gnaphosa sericata* (L. Koch).—The four specimens collected were found in areas with sandy soil and little available ground cover, a niche that other gnaphosids seemed to avoid. Spiders were taken from under small bits of wood, cow manure, and in a pitfall trap. Of two immature females caught on 20 May, one molted to maturity on 8 June and the second molted on 13 June (penultimate) and 24 July.

(16) *Haplodrassus chamberlini* Platnick and Shadab.—Twenty individuals were found from March to May, eighteen under stones in grassy pastures and rough, eroded areas. Six penultimate spiders (four females and two males) collected on 16 March all molted to adults by 27 March. This is a new state record for this species: the closest previous records are Roosevelt County, New Mexico, and Texas County, Oklahoma (Platnick and Shadab 1975b). Its presence in north-central Texas extends the range 270 miles to the southeast.

(17) *Haplodrassus signifier* (C. L. Koch).—Forty-one specimens were found from March to June, most of them under stones. Three females were collected on 19 May, each protecting one large and one small egg sac. The large sacs were drab and dirty while the small sacs were obviously newer because they were whiter. Each female, when exposed, tried to move the large egg sac to safety by carrying it in her chelicerae. The large sac of one female contained 232 second instar spiders and the small sac had 50 first instar spiderlings. The egg sacs of the second female held 94 first instar spiders and 24 eggs. The sacs of the third female contained 160 second instar spider and 26 first instar spiderlings. Three penultimate spiders molted on 21 February (female), 21 March (male), and 24 March (female). A late instar spider, probably *H. signifer,* was parasitized by the acrocerid fly *Ogcodes eugonatus* Loew. The larva ruptured the abdomen of the spider, pupated on 18 April, and the adult female emerged on 29 April.

(18) *Herpyllus bubulcus* Chamberlin.—A single female was collected on 3 March from a rock pile in Hardeman County by an araneology student.

(19) *Herpyllus ecclesiasticus* Hentz.—This widespread species is opportunistic as to habitat. Fourteen specimens collected from February to August were found indoors, under tree bark, on trees, and in grass. A penultimate female found 11 July molted on 3 August.

(20) *Herpyllus hesperolus* Chamberlin.—Two females were collected on 20 March along a rocky, eroded hillside. This discovery extends the range approximately 400 miles east of a line from Pecos County, Texas, to the Big Meddy Valley in Saskatchewan (Platnick and Shadab 1977).

(21) *Micaria.—Micaria* is present in the area. This genus is currently under revision and is not dealt with within this paper.

(22) *Nodocion floridanus* (Banks).—Only four specimens have been recorded from this area. The single specimen examined was a male collected from a wasp nest in Wichita County. Records indicate another male from Wichita County was found under tree bark and two males were found in a tamarisk bower in Baylor County (Platnick and Shadab 1980a).

(23) *Nodocion rufithoracicus* Worley.–Eight spiders (4 males and 4 females) were found from March to August in Wichita County under rocks in broken eroded country. A penultimate male collected on 18 March molted on 23 March. This material extends the range 320 miles east of a line extending from Eddy County, New Mexico, to Divide County, North Dakota (Platnick and Shadab 1980a).

(24) *Rachodrassus captiosus* (Gertsch and Davis).–A single male was found in June under a piece of railroad tie at the base of a high bluff. Previous specimens are known only from San Luis Potosi, Mexico, and Cameron and San Patricio counties of the south Texas coast. This is a range extension of over 400 miles to the north.

(25) *Sergiolus angustus* (Banks).–A single female was collected along a rocky hillside in March. The only other Texas record for the species is Kleberg County on the coast of south Texas. This is a range extension of approximately 100 miles east of a line from northern Colorado to Kleberg County, Texas (Platnick and Shadab 1981).

(26) *Sergiolus bicolor* Banks.–Two males collected in June were found, one under a stone and the other indoors.

(27) *Sergiolus lowelli* Chamberlin and Woodbury.–This form is found throughout the area and is variable in habitat. Nine specimens were collected from March to October in grass, indoors, from a bird's nest, a tamarisk bower, and a tarpaulin.

(28) *Sergiolus stella* Chamberlin.–A female was collected on 19 May along a stony, eroded hillside. The spider molted on 2 June and 28 June. The record extends the range 100 miles west northwestward from Denton County, Texas (Platnick and Shadab 1981).

(29) *Zelotes aiken* Platnick and Shadab.–Four specimens were taken during March and April from Clay, Montague, and Wichita counties. The spiders were found along a lake shore, under rocks, and in Bermuda grass. A penultimate male caught 31 March molted that day.

(30) *Zelotes anglo* Gertsch and Riechert.–A single male was found in Wichita County and Platnick and Shadab (1983) record a male from Wilbarger County. The Wichita County specimen was taken in September from a pitfall trap set in an open pasture.

(31) *Zelotes gertschi* Platnick and Shadab.–This was the most common *Zelotes* detected. Forty specimens were collected from Archer, Clay, and Wichita counties, mostly between March and July under stones, boards, railroad ties, and cardboard. Eighteen laboratory reared spiders molted one to four times between 24 March and 4 August. Six were males and all had matured by 13 June, with most maturing in April. The maturity dates of the females were much later: two matured in April, six in May, two in June, one in July and one in August.

(32) *Zelotes pseustes* Chamberlin.–Two males (collected 10 January and 28 February) and two females (collected 24 April and 16 August) were found under a rock and a board, in dead leaves, and in a pitfall trap set in sand.

(33) *Zelotes tuobus* Chamberlin.–A single male was taken on 28 April, 1975, from under a rock in Wichita County.

(34) Addendum.–Dr. Norman Platnick has recently (personal communication March 30, 1984) identified two European species that were collected from north-central Texas. Two males of *Urozelotes rusticus* (Koch L.) were collected in homes in Wichita County in June 1976 and May 1977. A single female of *Trachyzelotes lyonneti* (Audouin) was collected in May 1975 from the ground in Baylor Co.

In addition to the confirmed gnaphosid fauna, based on records from surrounding counties, range maps, and habitat data, an additional two genera and nine species are

believed to occur in north-central Texas. *Callilepis imbecilla* (Keyserling) is present in Comanche County, Oklahoma, and has been found under leaf litter and boards (Platnick 1975) and under stones in pastures and dry, sandy areas (Kaston 1981). *Cesonia bilineata* (Hentz) ranges from New Mexico to the Atlantic coast and has been collected in open and tall grass prairies, mesquite woods, and Bermuda grass (Platnick and Shadab 1980b). *Drassodes auriculoides* Barrows is known from Comanche County, Oklahoma. Platnick and Shadab (1976a) list leaf litter and a pasture as habitats and Kaston (1981) reports this species can be found under stones and logs. *Rachodrassus exlineae* Platnick and Shadab (female) is known from Comanche County, Oklahoma. *Sergiolus montanus* (Emerton) is found across the contiguous states and has been collected from under rocks, bark, dry cow dung, and indoors (Platnick and Shadab 1981). *Sosticus insularis* (Banks) is known from Comanche County, Oklahoma, and Dallas County, Texas, and has been found under bark and indoors (Platnick and Shadab 1976b). *Synaphosus syntheticus* (Chamberlin) has been recorded from Dallas County, Texas; it has been found indoors and in salt cedar, cottonwood, and mesquite litter (Platnick and Shadab 1980a). *Zelotes hentzi* Barrows ranges across the United States except for the Southwest and has been collected from under rocks, boards, logs, and in cottonwoods, cotton fields, pecan groves, prairies, and meadows (Platnick and Shadab 1983). *Zelotes lasalanus* Chamberlin is present in Tarrant County, Texas, and has been found under debris, dung, and stones, and in grass, mesquite, meadows, and prairies (Platnick and Shadab 1983).

Of the 32 species that have been reported from north-central Texas, 16 are represented by four or less specimens taken in 14 months of intensive collecting. Further collecting may be expected to produce additional species records and natural history data.

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